

WHAT IS CLAIMED IS:

1. A heat exchanger tube expanding apparatus for a heat exchanger having a plurality of laminated radiating fins having penetrating apertures on peripheral edge portions of which fin collars are disposed upright and having substantially U-shaped hairpin tubes inserted through the penetrating apertures in a direction of lamination of the radiating fins, said tube expanding apparatus integrally securing the plurality of radiating fins by expanding straight portions of the hairpin tubes to place the hairpin tubes in pressure contact with the fin collars, said tube expanding apparatus comprising:

mandrels each having a billet on a leading end;

a reciprocating actuator for supporting rear ends of the mandrels, said reciprocating actuator being supported so as to be able to reciprocate in an axial direction of the hairpin tube straight portions;

a pressure drive source for raising and lowering said reciprocating actuator and expanding the straight portions by pressing the billets into the hairpin tube straight portions;

hairpin receivers for supporting curved portions of the hairpin tubes;

a fin receiver disposed at an end near the curved portions of the hairpin tubes for supporting an end portion of the plurality of laminated radiating fins; and

a raising and lowering means for raising and lowering said fin receiver in the axial direction of the hairpin tube straight portions,

wherein said raising and lowering means lowers the fin receiver to a predetermined position as the mandrels descend and the billets begin to be inserted into the hairpin tubes.

2. The heat exchanger tube expanding apparatus according to Claim 1, wherein said raising and lowering means is a hydraulic cylinder disposed between the fin receiver and a receiver platform.
3. The heat exchanger tube expanding apparatus according to Claim 1, wherein said raising and lowering means lowers said fin receiver at a speed that increases in stages as tube expansion progresses.
4. The heat exchanger tube expanding apparatus according to Claim 3, wherein said raising and lowering means is a hydraulic cylinder disposed between said fin receiver and a receiver platform.
5. The heat exchanger tube expanding apparatus according to Claim 1, wherein said raising and lowering means is an elastic body disposed between said fin receiver and a receiver platform.
6. The heat exchanger tube expanding apparatus according to Claim 5, wherein the elastic body is made of resin.
7. The heat exchanger tube expanding apparatus according to Claim 1, further comprising:
 - a vibrating means for vibrating said hairpin receivers.
8. The heat exchanger tube expanding apparatus according to Claim 7, wherein said vibrating means is an ultrasonic vibrator disposed between said hairpin receivers and a receiver platform.